No. 763,433. PATENTED JUNE 28, 1904.

R. SEELIG.

TELESCOPE ADJUSTMENT.

APPLICATION FILED NOV. 30, 1903.

NO MODEL.

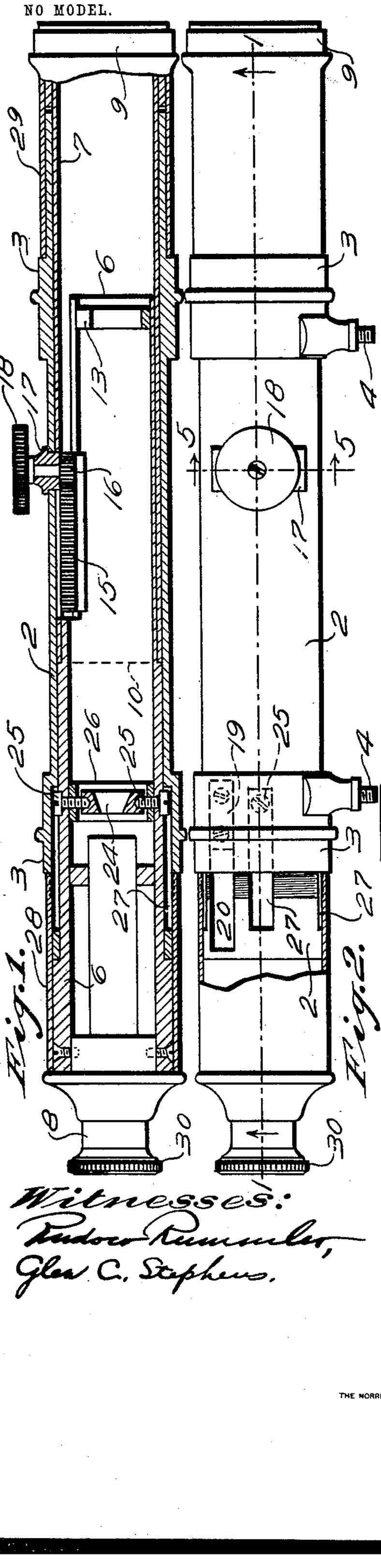

Fig. 1.

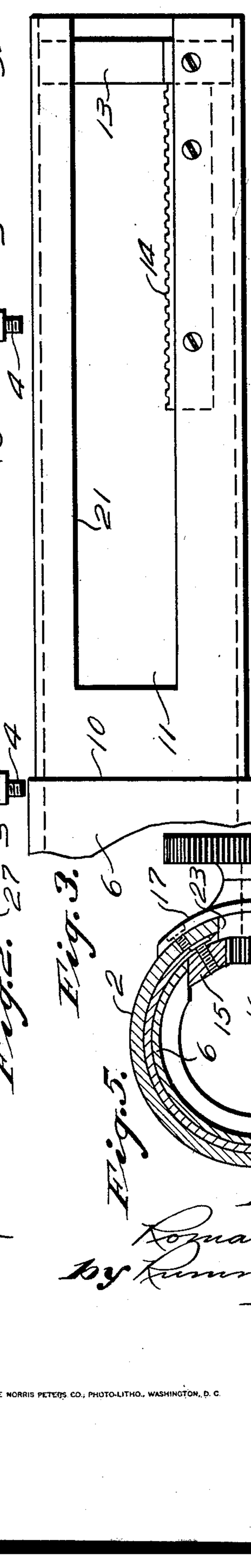

Fig. 2.

Fig. 3.

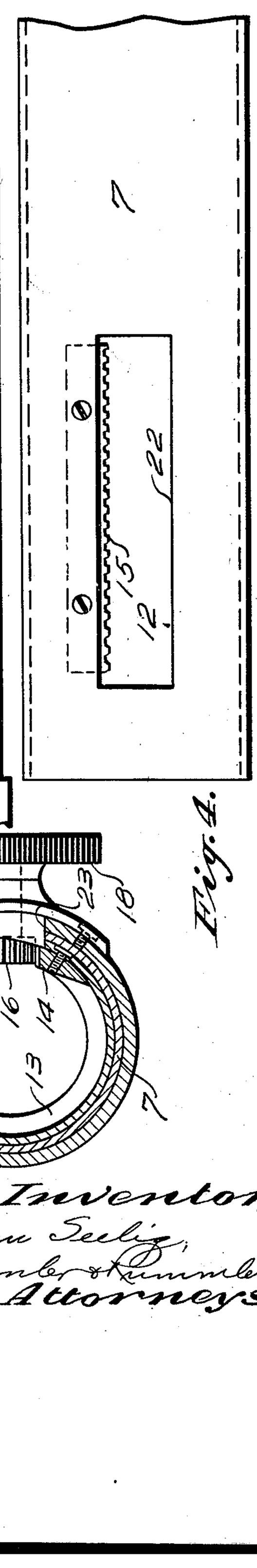

Fig. 4.

Fig. 5.

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UNITED STATES PATENT OFFICE.

ROMAN SEELIG, OF CHICAGO, ILLINOIS.

TELESCOPE ADJUSTMENT.

SPECIFICATION forming part of Letters Patent No. 763,433, dated June 28, 1904.

Application filed November 30, 1903. Serial No. 183,170. (No model.)

To all whom it may concern:

Be it known that I, ROMAN SEELIG, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Telescope Adjustments, of which the following is a specification.

My invention relates to telescopes, particularly such as are used in surveyors' instruments.

It has heretofore been the practice in the construction of surveyors' levels, transits, &c., to provide telescopes having their main focusing adjustment at one end only. This change in the disposition of the weights of the instrument during focusing disturbs the balance of the instrument and often necessitates the releveling of the same whenever it is focused upon a new object.

The main objects of my invention are to provide a telescope for use in a surveyor's instrument and adapted to permit changes in the focusing thereof without affecting the balance of the instrument and to provide simple and inexpensive mechanism for accomplishing this purpose. I accomplish these objects by the device shown in the accompanying drawings, in which—

Figure 1 is a longitudinal section of the telescope of a surveyor's level constructed according to my invention. Fig. 2 is a side elevation of the same, partly broken away. Fig. 3 is a top plan, partly broken away, of the inner portion of the tube to which the eyepiece is connected. Fig. 4 is a top plan, partly broken away, of the inner portion of the tube which carries the objective lens. Fig. 5 is a transverse section on the line 5 5 of Fig. 2.

In the drawings the tripod and supporting-frame of the instrument are omitted, since the invention herein set forth applies only to the telescope. In the construction shown the body of the telescope consists of three tubes disposed in axial alinement and telescoping each other. The primary tube 2 is provided with the usual collars 3 for engaging the **Y**'s of the frame and for the purpose of this description will be considered as representing the frame. The threaded studs 4 support the spirit-level, which is not shown in the drawings.

Telescoping into each end of the primary tube 2 and in alinement with each other are two secondary tubes 6 and 7, which respectively carry the eyepiece 8 and the fitting 9, within which the objective lens is seated. The inner end of the tube 6 is reduced in outer diameter at the shoulder 10 and fits within the inner end of the tube 7. The secondary tubes have near their inner ends longitudinally-disposed slots 11 and 12. The slot 11 in the tube 6 extends to the inner end of the tube, so as to permit the parts to be readily separated or assembled. The inner slotted end of the tube 6 is braced by means of an inner collar 13. Secured to the tube 6 along one side of the slot 11 is a rack 14, and the tube 7 is provided with a similar rack 15, secured at the opposite side of the slot 12. A pinion 16 is journaled in a fitting 17, rigidly secured to the primary tube 2, and the pinion 16 is adapted to be rotated by means of a knurled head 18. Since opposite sides of the pinion 16 mesh with racks respectively secured to the tubes 6 and 7, it will be seen that rotation of the pinion 16 will cause the tubes 6 and 7 to be simultaneously moved in opposite directions at equal speeds.

A guide-block 19, secured to the tube 6 and projecting into a guide-slot 20 in the primary tube 2, limits the longitudinal movement of the tube 6 and through the pinion 16 also limits the movement of the tube 7. The block 19 fits snugly against the side edges of the slot 20 and prevents rotation of the tube 6 relatively of the tube 2. The slot 20 is extended in the form of a groove under the sleeve 3, thus leaving the outer periphery of said sleeve unbroken for engagement with the **Y**'s of the supporting-frame. The edge 21 of the slot 11 and the edge 22 of the slot 12 also fit the parallel sides 23 of the fitting 17 and further secure the tubes 6 and 7 against rotation.

The ring 24, which supports the cross-wire, is adjustable transversely by means of the four set-screws 25, which extend through the walls of the tube 6 at right angles to each other, said walls being reinforced locally by means